Telecommunications Industries Analysis Project

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March 11, 1998

Ms. Magalie Roman Salas
Secretary of the Commission
1919 M Street, NW, Room 222
Washington, DC 20554

Dear Ms. Salas,

I am filing the attached research paper in my role as faculty member and academic researcher at the Public Utility Research Center, College of Business Administration, University of Florida. This is an informational document for *In the Matter of the Joint Board on Universal Service*, CC Docket No. 96-45.

The enclosed paper is *Payers and Receivers: Various Proposals for the High Cost Fund* as well as an executive summary.

The views expressed in this paper are those of the Telecommunications Industries Analysis Project. The information in this paper is intended to provide general public information and does not constitute or foretell the official position of any of the parties who contributed to this paper. The opinions expressed in this paper do not necessarily reflect the views of any agency or company.

In accord with FCC guidelines, I am submitting two original's of the paper and executive summary.

Sincerely,

Carol Weinhaus

Carol Weinhaus

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List ABCDE

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Payers and Receivers: Various Proposals for the High Cost Fund

Executive Summary

March 1, 1998; Revised March 5, 1998
Presentation at the March 1998 NARUC Meeting
Washington, DC

Telecommunications Industries Analysis Project

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Payers and Receivers: Various Proposals for the High Cost Fund
Executive Summary, cont.

Objective
This paper models options for the federal high cost fund (HCF) on a comparable basis that allows the reader to examine the effect on customers and states.

Focus of the Model
This paper only focuses on one portion of the new universal service fund — support for high-cost, non-rural companies. This paper does not discuss other current subsidies as well as new support mechanisms required by the *Telecommunications Act of 1996* (such as funding telecommunications for schools, libraries, and rural health care). **Figure 1** shows the universal service fund, which includes existing and new subsidies.

The 1998 total high cost fund is $1,723.6 million with $341.2 million for the non-rural companies and $1,382.4 million for the rural companies. The non-rural amount is replaced with the proxy models' results in modeling Options 2 to 6. The total amount is replaced with the proxy models' results in modeling Options 1A to 1C.

Some Questions to Ask about Options for the New Fund
There are certain questions that should be answered to determine if the new high cost fund meets the requirements of the *Act of 1996*, the needs of a competitive industry, and accomplishes the goal of supporting truly high-cost areas. Some of these questions are: Does the fund accomplish the goal of providing sufficient support to high-cost areas so that rates can be affordable? Is the fund competitively neutral? Is the revenue neutral? Is it explicit?

Modeling the Size of the Fund
The fund is sized at different revenue benchmarks (generally $30, $40, and $50) using both the BCPM and the HAI models. The resulting sizes probably will not be the amount produced in the final model adopted by the FCC. The illustrations and the range of amounts shown should be used as *indicators* for the size of the fund and the impact on the states and the customers. .

Modeling the Impact on Individual States
The accompanying paper contains charts where individual states can see, on a per line per month or on a per telephone number per month basis, whether the state is a net payer or net receiver of the fund. A state may need more or less than the amounts modeled in the paper. This paper does not recommend any method of reduction in prices for services. In evaluating the options in this paper, one of the questions that needs to be answered is "Will the state be better or worse off than it is today?" **(Figure 2)**.

Descriptions of FCC's Plan and the Various Options Modeled:
Hypothetical nationwide surcharges are calculated to allow comparisons among options **(Figure 3)**. Depending on the option, actual collection may be through service rates or end user charges.

- **Option 1A: Ad Hoc Proposal**
  Proposed by an ad hoc National Association of Regulatory Utility Commissioners (NARUC) work group **(Figure 3A)**. This option sends funds to those states with average costs above an established nationwide average. This option also sets rules for state distribution of these funds. It should be noted that the Ad Hoc proposal's calculations does not include high cost support for Alaska and Puerto Rico, or any current Long Term Support. Eligible states receive funds based on the following choices:

1. The lesser of embedded costs and incremental costs (results based on the proxy models).
2. The greater of the result from the above step and "hold harmless" data (current amount received from the old universal service fund, or USF).

- **Option 1B: Modified Ad Hoc Proposal — Proxy Model Results or "Hold Harmless"**
  This option is the same as Option 1A except that it omits embedded costs in determining the results **(Figure 3B).**

- **Option 1C: Modified Ad Hoc Proposal — Proxy Model Results or "Hold Harmless" with 50% or 40% Interstate**
  This option is the same as Option 1A except that it omits embedded costs in determining the results, and changes the interstate support to 50% or 40% of the calculated support from the proxy models **(Figure 3C).**

- **Option 2: $50 Interstate Benchmark; $30 State Benchmark**
  This option increases the support defined in Option 4A (the FCC Plan) for those areas with very high costs for providing local service **(Figure 3D).**

- **Option 3: Density Zones**
  This option targets federal funds for the least populated areas of the country where costs are highest and where competition will probably develop more slowly, if at all **(Figure 3E).**

- **Option 4A: FCC's Plan: 25% Interstate/75% State**
  In the FCC Plan, the high cost fund is based on a federal contribution of 25% of the calculated support and the states may be responsible for the remaining contribution of 75% **(Figure 3F).** The plan also allows for an adjustment to interstate access to reflect the net of the following:
  1. Increases in interstate access to recover payments made by the local exchange companies into the fund for high-cost areas/low-income households, schools and libraries, and rural health care subsidy requirements; and
  2. Decreases in interstate access to reflect support received by the local exchange companies from the fund for their high-cost areas.

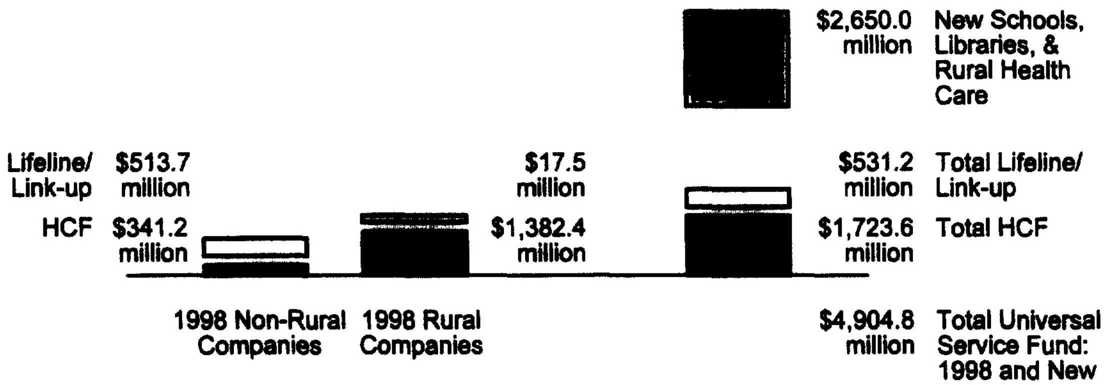
- **Option 4B: Modified FCC Plan: 40% Interstate/60% State**
  This option shows the impact of increasing the federal support from 25% to 40% and decreasing the potential state responsibility accordingly **(Figure 3G).**

- **Option 5: Telephone Numbers**
  In this option, there is a nationwide surcharge applied to each telephone number per month on the customer's bill **(Figure 3H).** This option is an overall approach to funding universal service without regard to past interstate/state jurisdictional distinctions. The entire fund is recovered from one mechanism and the federal fund recovers 100% of the support.

- **Option 6: Percentage of Retail Revenues**
  In this option there is a nationwide surcharge assessed as a percentage of total retail revenues on the customer's bill **(Figure 3I).** This option is an overall approach with the entire fund being recovered using one mechanism. The basis for assessment of the dollars is a uniform percent charge on total retail revenues and the federal fund recovers 100% of the support.

For Option 5 and Option 6, to be competitively neutral, the surcharges should be applied entirely to the end user and must be applied by all companies to their customers.

Figure 1: Total Universal Service Fund — 1998 Subsidies and New Subsidies



	Dollars (in Millions)		
1998 Subsidies	**Non-Rural Companies**	**Rural Companies**	**Total**
Lifeline/Link-up: Renamed "Low Income Fund"	$513.7	$17.5	$531.2
1998 High Cost Fund (HCF):			
Long Term Support (LTS)	$124.5*	$346.6	$471.1
*Weighted Dial Equipment Minutes (DEM): Renamed "Local Switching Support"	0.0*	426.8	426.8
Old Universal Service Fund (USF): Renamed "High Cost Loop Fund"	216.7*	609.0	825.7
Total High Cost Fund	341.2*	1,382.4	1,723.6
New Subsidies**			
Schools and Libraries			$2,250.0
Rural Health Care Providers			400.0
Total Education and Health Care			2,650.0
Total Universal Service Fund (USF)			$4,904.8

* In modeling the options in this paper, the total high cost fund (HCF) for the non-rural companies is replaced by data from the proxy models (BCPM and HAI). This proxy model data is then added to the rural data. Non-rural companies are those LECs with a total of more than 100,000 access lines. Rural companies are those with a total of 100,000 access lines or less.

**The amounts are based on the maximum levels set by the FCC.

Figure 2: Comparison of Current and Proposed High Cost Fund Support (Option 4: FCC Plan, $30 Benchmark), Net Payers and Receivers per Access Line per Month, BCPM and HAI

	Difference between Current and Proposed (in dollars)					
	Net Receiver			Net Payer		
Amount of Benchmark (in dollars)	$30			$30		
	High	Low	Average	High	Low	Average
BCPM	$3.92	$0.00	$0.73	- $10.14	- $0.00	- $0.67
HAI	$1.26	$0.02	$0.21	- $10.22	- $0.07	- $0.35

Figure 3: Comparison of Various Options for the High Cost Fund: Hypothetical Monthly Surcharges

Figure 3A, Option 1A: Ad Hoc Proposal

	Option 1A: Nationwide Surcharge* (%)	Interstate Fund: Net of 75% Interstate Incremental, Embedded, and "Hold Harmless" (in millions)
Amount of Benchmark (in dollars)	Average Cost	Average Cost
BCPM	2.4%	$1,699 m
HAI	1.7%	$1,196 m

*This hypothetical surcharge is based on 1996 interstate retail revenues. The benchmark for the proxy models is set at average cost. For BCPM this is $34.20 and for HAI it is $21.38. The benchmark for embedded cost is set at 105% of average cost, $35.58.

Figure 3B, Option 1B: Modified Ad Hoc Proposal — Proxy Model Results or "Hold Harmless"

	Option 1B: Nationwide Surcharge* (%)	Interstate Fund: Net of 75% Interstate Incremental and "Hold Harmless" (in millions)
Amount of Benchmark (in dollars)	Average Cost	Average Cost
BCPM	6.2%	$4,461 m
HAI	3.5%	$2,514 m

*This hypothetical surcharge is based on 1996 interstate retail revenues. The benchmark for the proxy models is set at average cost. For BCPM this is $34.20 and for HAI it is $21.38.

Figure 3: Comparison of Various Options for the High Cost Fund: Hypothetical Monthly Surcharges, cont.

Figure 3C, Option 1C: Modified Ad Hoc Proposal — Proxy Model Results or "Hold Harmless"

	Option 1C: Nationwide Surcharge* (%)	**Interstate Fund: Net of 50% Interstate Incremental and "Hold Harmless" (in millions)**
Amount of Benchmark (in dollars)	Average Cost	Average Cost
BCPM	4.1%	$2,948 m
HAI	2.2%	$1,623 m

	Option 1C: Nationwide Surcharge* (%)	**Interstate Fund: Net of 40% Interstate Incremental and "Hold Harmless" (in millions)**
Amount of Benchmark (in dollars)	Average Cost	Average Cost
BCPM	3.3%	$2,358 m
HAI	1.8%	$1,299 m

*This hypothetical surcharge is based on 1996 interstate retail revenues. The benchmark for the proxy models is set at average cost. For BCPM this is $34.20 and for HAI it is $21.38.

Figure 3D, Option 2: $50 Interstate Benchmark; $30 State Benchmark

	Option 2: Nationwide Surcharge* (%)	**Interstate Fund: 100% above $50 plus 25% ($50 - $30) (in millions)**	**Remaining State Responsibility75% ($50 - $30) (in millions)**
Amount of Benchmarks (in dollars)	$30 and $50	$30 and $50	$30 and $50
BCPM	11.5%	$8,318 m	$3,352 m
HAI	3.5%	$2,556 m	$1,072 m

*This hypothetical surcharge is based on 1996 interstate retail revenues. This surcharge is for comparison purposes only. Actual collection is through service rates. The federal surcharge is the sum of costs above $50 and 25% of the difference between the $30 benchmark and the $50 benchmark. The remaining state amount is 75% of the difference between the two benchmarks.

Figure 3: Comparison of Various Options for the High Cost Fund: Hypothetical Monthly Surcharges, cont.

Figure 3E, Option 3: Density Zones

	Option 3: Nationwide Surcharge* (%)	**Interstate Fund (in millions)**	**Remaining State Responsibility (in millions)**
Amount of Benchmark (in dollars)	Zone 1 $30	Zone 1 $30	Zone 1 $30
BCPM	5.5%	$3,965 m	$7,704 m
HAI	3.3%	$2,410 m	$1,866 m

*This hypothetical surcharge is based on 1996 interstate retail revenues.

Figure 3F
Option 4A: FCC's Plan: 25% Interstate/75% State

	Option 4A: Nationwide Surcharge* (%)			**Interstate Fund (in millions)**			**Remaining State Responsibility (in millions)**		
Amount of Benchmark (in dollars)	$30	$40	$50	$30	$40	$50	$30	$40	$50
BCPM	5.5%	4.2%	3.9%	$3,938 m	$3,063 m	$2,820 m	$7,732 m	$5,109 m	$4,380 m
HAI	2.7%	2.3%	2.2%	$1,927 m	$1,693 m	$1,570 m	$1,701 m	$999 m	$629 m

*This hypothetical surcharge is based on 25% of 1996 interstate retail revenues. This surcharge is for comparison purposes only. Actual collection is through service rates.

Figure 3: Comparison of Various Options for the High Cost Fund: Hypothetical Monthly Surcharges, cont.

Figure 3G, Option 4B: Modified FCC Plan: 40% Interstate/60% State

	Option 4B: Nationwide Surcharge* (%)			Interstate Fund (in millions)			Remaining State Responsibility (in millions)		
Amount of Benchmark (in dollars)	$30	$40	$50	$30	$40	$50	$30	$40	$50
BCPM	7.6%	5.7%	5.1%	$5,484 m	$4,085 m	$3,696 m	$6,186 m	$4,087 m	$3504 m
HAI	3.1%	2.6%	2.3%	$2,267 m	$1,893 m	$1,695 m	$1,361 m	$799 m	$503 m

*This hypothetical surcharge is based on 40% of 1996 interstate retail revenues. This surcharge is for comparison purposes only. Actual collection is through service rates.

Figure 3H, Option 5: Telephone Numbers

	Option 5: Nationwide Surcharge* per Telephone Number per Month (in dollars)			Total Fund (in millions)		
Amount of Benchmark (in dollars)	$30	$40	$50	$30	$40	$50
BCPM	$4.20	$2.94	$2.59	$11,670 m	$8,173 m	$7,201 m
HAI	$1.31	$0.97	$0.79	$3,628 m	$2,692 m	$2,198 m

*This hypothetical surcharge is based on 1996 total (interstate and state) retail revenues. This surcharge would apply to each telephone number per month. To be competitively neutral, this surcharge should be applied entirely to the end user and must be applied by all companies to their customers.

Figure 3I, Option 6: Percentage of Retail Revenues

	Option 6: Nationwide Surcharge* on Percentage of Retail Revenues(%)			Total Fund (in millions)		
Amount of Benchmark (in dollars)	$30	$40	$50	$30	$40	$50
BCPM	6.2%	4.3%	3.8%	$11,670 m	$8,173 m	$7,201 m
HAI	1.9%	1.4%	1.2%	$3,628 m	$2,692 m	$2,198 m

*This hypothetical surcharge is based on 1996 total (interstate and state) retail revenues. To be competitively neutral, this surcharge should be applied entirely to the end user and must be applied by all companies to their customers.

Project Information

List of Participants in the Telecommunications Industries Analysis Project

February 1998

State Regulators	NARUC Representatives from: California Public Utilities Commission Florida Public Service Commission Illinois Commerce Commission Iowa Utilities Board Massachusetts Department of Telecommunications and Energy
Companies and Governments	AT&T Bell Atlantic BellSouth Corning GTE Kalona Cooperative Telephone MCI Telecommunications Corp. Nortel NTT America SBC Communications Inc. Sprint Sprint Local Telecom Division U S WEST

Sponsors:

Corporation for Public Broadcasting

Assisting with *public* data:

Bellcore
Federal Communications Commission
National Exchange Carrier Association
National Telecommunications and Information Administration

Background on the Telecommunications Industries Analysis Project

The Telecommunications Industries Analysis Project (TIAP), a seven-year-old research consortium, conducts and reports impartial research in the areas where network planning, business financials, and public policy (regulation and legislation) intersect. The participants actively work together to develop new options for telecommunications policies to meet the needs of consumers, governments, and companies in a changing, competitive environment. Participants include regulators, domestic and foreign telecommunications companies, materials and equipment manufacturers, and other communications-based organizations.

The purpose of the Project is to produce research and analysis that will assist policy makers in making informed decisions.

TIAP incorporates the following features:

- **Neutral setting**
  The Project provides a neutral setting, free of partiality, thereby ensuring objective and independent research.

- **Multiple viewpoints**
  Participants play an active role in the research and analysis, represent their own interests, and understand and assist in developing others' perspectives.

- **Analysis and results of alternatives**
  The Project provides research data, tools, and models for critical decision making.

- **Public distribution of research**
  Data used by this Project are publicly available. Research products become public domain information.

Payers and Receivers: Various Proposals for the High Cost Fund

March 10, 1998

Presentation at the March 1998 NARUC Meeting
Washington, DC

Telecommunications Industries Analysis Project

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Telecommunications Industries Analysis Project:

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Carol Weinhaus, Sandra Makeeff, Brian Roberts, *et al.*
March 10, 1998

Presentation at the March 1998 NARUC Meeting, Washington, DC.

The views expressed in this paper do not necessarily reflect the viewpoints of individual participants.

We express appreciation to the Federal Communications Commission, Common Carrier Bureau, Industry Analysis Division, for assistance in providing underlying data for modeling options for the high cost fund. This information contributed to our state-by-state analysis.

The Telecommunications Industries Analysis Project is associated with the Public Utility Research Center at the University of Florida College of Business Administration.

For more information on the Project, contact Carol Weinhaus at the Project's address:

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List of Acronyms

ARMIS	Automated Reporting Management Information System
BCPM	Benchmark Cost Proxy Model
CFR	Code of Federal Regulations
CL	Common Line
CLEC	Competitive Local Exchange Carrier
CMRS	Commercial Mobile Radio Services
CTIA	Cellular Telecommunications Industry Association
DEM	Dial Equipment Minutes
FCC	Federal Communications Commission
HAI	Hatfield Associates, Inc. Model
HCF	High Cost Fund
ILECs	Incumbent Local Exchange Carriers
IS	Interstate
IXC	Interexchange Carrier
LEC	Local Exchange Carrier
LTS	Long Term Support
MOU	Minutes of Use
NARUC	National Association of Regulatory Utility Commissioners
NECA	National Exchange Carrier Association
PCIA	Personal Communications Industry Association
PCS	Personal Communications Services
REA	Rural Electrification Administration
RHC	Rural Health Care
TIAP	Telecommunications Industries Analysis Project
U.S.	United States
USAC	Universal Service Administrative Company
USF	Universal Service Fund

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I. Introduction

Objective

This paper models various proposals for the new high cost fund (HCF) that starts January 1, 1999.[1] The proxy cost models are slated to determine the HCF amounts for the large local exchange carriers (LECs), called "non-rural companies". The rural LECs will continue with the current mechanisms until new ones are developed.[2]

The calculations in this paper build on earlier modeling of options.[3] Where possible, the results are calculated on a comparable basis, allowing the reader to examine the effect on customers and states.

This paper models six different options and some variations. Some options are new; others are from a previous paper, *Options for Universal Service*. These earlier options are recalculated with the new input numbers.[4]

Time constraints limited the modeling and description of options in this paper. Other options that use variations of the mechanisms described in this paper or that use completely different mechanisms are also possible.

This paper focuses on support for high-cost areas. It omits assistance to low-income households as well as new support mechanisms required by the *Telecommunications Act of 1996*, such as funding telecommunications for schools, libraries, and rural health care.[5] While the focus of the options is on the high cost fund for the non-rural companies, the high cost fund amounts for the rural companies are included in the results to show the total impact. For each option, this paper shows which states are net payers and receivers from the high cost fund. It does not recommend any method of reduction in prices for services offered by companies receiving subsidies.

The sections in this paper cover the following items:

- **Section II, What Does Each Option Cover?:** Provides a description of the high cost fund, the overall method used to model various options for this fund, a brief description of each option, and a comparison of the current and the proposed treatment of these subsidies.
- **Section III, Option 1A: Ad Hoc Proposal:** Describes and models Option 1A, the Ad Hoc Proposal. Results show a hypothetical nationwide surcharge, the size of the high cost fund, which states pay and which states receive dollars from this fund. Results of this option and other options in **Section IV** through **Section XII** allow comparisons among options.
- **Section IV, Option 1B: Modified Ad Hoc Proposal — Proxy Model Results or "Hold Harmless":** Describes Option 1B.
- **Section V, Option 1C: Modified Ad Hoc Proposal — Proxy Model Results or "Hold Harmless" with 50% or 40% Interstate:** Describes Option 1C.
- **Section VI, Option 2: $50 Interstate Benchmark; $30 State Benchmark:** Describes Option 2.
- **Section VII, Option 3: Density Zones:** Describes Option 3.

I. Introduction, cont.

- **Section VIII, Option 4A: FCC Plan: 25% Interstate/75% State:** Describes Option 4A.
- **Section IX, Option 4B: Modified FCC Plan:** 40% Interstate/ 60% State: Describes Option 4B.
- **Section X, Option 5: Telephone Numbers:** Describes Option 5.
- **Section XI, Option 6: Percentage of Retail Revenues:** Describes Option 6.
- **Section XII, Appendix A: What is the History of these Issues?:** Provides a brief historical background on subsidies, both explicit and implicit.
- **Section XIII, Appendix B: Cash Flow Diagram:** Shows the cash flow for the FCC's new universal service plan for current subsidy mechanisms which includes the high cost fund.
- **Section XIV, Appendix C: Sources, Calculations, and Assumptions:** Provides background on sources, calculations, and assumptions used to model the options.
- **Section XV, Appendix D: Input Data:** Provides the input data for developing the net payer and receiver charts for the FCC's plan, Option 5 (Telephone Numbers), and Option 6 (Percentage of Retail Revenues).
- **Section XVI, Notes:** Provides sources and additional technical background.

II. What Does Each Option Cover?

What is the New High Cost Fund?

Currently, the FCC, in consultation with the Federal-State Joint Board, is in the process of determining the amount of subsidy that should be provided to high-cost areas for non-rural companies. While this paper only focuses on one aspect of the subsidy issue, there are other subsidies that will also have an impact on which states are net payers and receivers.

The table in **Figure 1** provides a list of the 1998 subsidies, for both rural and non-rural companies. **Figure 1** also provides the old and new names for the components of the high cost fund.

The 1998 total subsidy amount, with the high cost fund (assistance for high-cost companies), lifeline/link-up (assistance to low-income households), and the new schools, libraries and rural health care payments, is $4.9 billion. The focus of this paper is on various options for the new high cost fund, as it will exist on January 1, 1999, for non-rural companies. The 1998 non-rural high cost fund is $341.2 million.

What Does this Paper Model?

The purpose of this paper is to demonstrate, in a comparable manner, the effect on customers and states, assuming a federal fund of various sizes, and assuming the fund is collected using diverse options. Two forward-looking cost models, the Benchmark Cost Proxy Model (BCPM) and the Hatfield Associates, Inc. Model (HAI), are under consideration for this task.[6] This paper will not address nor make any judgments on the models. The results for the options are modeled using six differently sized funds (unless otherwise specified by the option).

All assumptions in this paper represent the new high cost fund, as it will exist on January 1, 1999. This paper only explores options for the new 1999 high cost fund for non-rural companies.[7] **Figure 1** shows the 1998 rural and non-rural components of the high cost fund. The total high cost fund is $1,723.6 million with $341.2 million for the non-rural companies and $1,382.4 million for the rural companies.

Figure 2 shows the method used to calculate which states are net payers and net receivers from the new high cost fund in 1999 for Options 2 through 6. The 1998 non-rural high cost fund amount of $341.2 million is replaced with the results of modeling various options. These results are added to the 1998 high cost fund amounts for rural companies to produce the 1999 totals for the various options. Options 2 through 6 use only proxy model non-rural costs because the FCC's Plan initially only covers non-rural company costs. Options 1A, 1B, and 1C include both rural and non-rural company costs since this is part of the Ad Hoc Proposal.[8] All options use both the BCPM and the HAI proxy model data.[9]

Options 1A, 1B, and 1C use FCC's recommended benchmarks of $31 for residence and $51 for business. For the remaining Options 2 through 6, the fund is sized at one to three revenue benchmarks ($30, $40, and $50). The reader is cautioned that the size of the fund produced with these benchmarks will probably not be the amount produced in the final model adopted by the FCC. The illustrations and the range of amounts shown should be used as *indicators* for the size of the fund and the impact on the states and the customers.